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The Specific Engagement: A Didactic Center in Collaboration With the Adjacent Children's Museum

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A Didactic Center:
in collaboration with the adjacent children's museum

Old Northern Avenue Bridge

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Thesis Statement

Architecture transcends the act of "making space" when it can engage the visitor through the realization of the what had yet to be perceived. This didactic realization can be accomplished through a series of specific moments which relate directly to the entirety of the complete experience. The sequence can be so intense or emotional that the visitor recognizes that they are meant to interact with the architecture through the varying levels of engagement and understanding.

Directly Related Issues

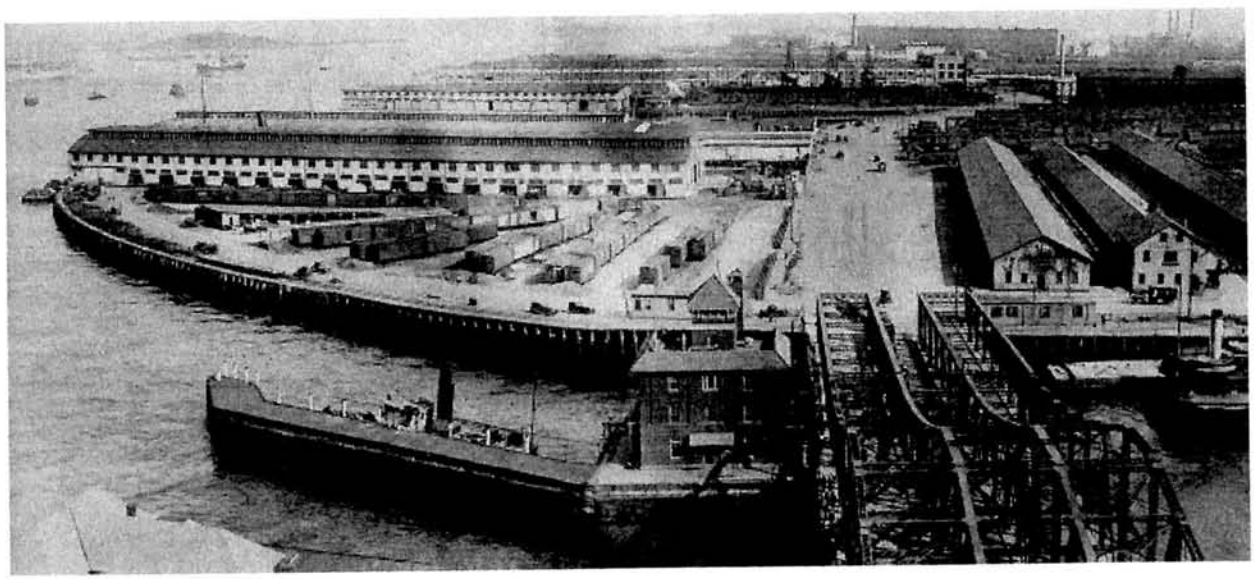
- architecture for architects
- various levels of engagement with architecture
  - elementary level (child)
  - intermediate level (adult)
  - level of the educated observer (architect and other)
- translating culture in architecture
  - Museo di Castelvecchio to the Old Northern Avenue Bridge
- the city of Boston and its history
- realization of the experience

Architects, architecture students, and architecture schools exert the effort to practice, learn, and teach the process of making architecture. However, the general public rarely realizes the idea of a building or its influences or origins. This split in understanding between the intentions of the architect and that which is not realized by the general public, creates the situation that an architect is making critical and significant architecture only for architects, a minute percentage of the population. The thesis will attempt to resolve a design problem of communicating to the visitors that they are meant to interact with the building. The communication of this desire is to be done through architecture. This is to ensure the visitors the enjoyment of discovering previously non-perceived moments through the activation of their senses and the ignition of their curiosity. Three different levels of engagement are being proposed. Through the analysis of how children, adults, and architects (and other educated observers) react to space, it is hoped that the project can actively engage a majority of people.

Carlo Scarpa's Castelvecchio is the central precedent and the main origin of the project. In part, the idea of Castelvecchio will be translated to the Old Northern Avenue bridge. This translation could take the form of a reaction to the location, structure, and movement of the bridge. Perhaps, that the bridge is in an industrial location or that the site is an entirely built condition. It could play off the history of Boston, like the Boston Tea Party or the presence of the ship, the "USS Constitution." This translation could be made through a representation of cobblestone and brick Boston or a representation of the granite wharves. This translation will

include the three different levels of engagement for children, adults, and architects.

Boston is the most European of the American cities. The past is evident in the brick and cobblestone buildings and narrow streets in the historical center. The present state exists with the past in skyscrapers, concrete structures, and highways. It was chosen as seemingly the best location to explore an architectural translation of culture, especially a European culture. It is hoped that this project can draw upon the history of Boston in the way Scarpa drew upon the history of Verona at the Castelvecchio. The history of Verona and the long occupation of the Castelvecchio are very much Italian. They are specific elements that cannot simply be reproduced in the United States or anywhere else. Furthermore, the architectural pallette of Carlo Scarpa cannot simply be reproduced because his details, his tectonic connections between materials, and his iconography is his alone. The project will need to be specific to Boston, to the history of Boston, to the site, and to American culture.



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View towards South Boston in 1910 when industrial warehouses covered Fan Pier and where the courthouse stands today

Supporting Discussion

The national governing body of Building Officials and Code Administrators passes a code requirement concerning the idea of architectural projects. The architect shall be required to state their intention and exactly where this intention comes to light clearly in the form of a sign. The sign, in the form of text and supporting diagrams, must hand over the idea of the building. It must answer the questions of the purpose of the building, the history of the site, documentation of the structure and tectonics, and the critical conditions of the building. The images must visually diagram the location of this critical conditions where the visitor will go to confirm what is understood from the sign. To ensure that the visitor is confronted with the sign, it is to be placed at the entry. The sign is to be four feet by eight feet located 36" inside of the front door. This way everyone would know the idea of building, but few would care to investigate it because the act of self-discovery would be taken from the experience.

The architect has the ability to hand out the idea of the building at the "front door" without giving it away, it would have to be handed out through the architecture. The enjoyment of architecture is in that of the discovery of the "game", the exploration of space, the absorption of texture, color and light. The hypothetical four foot by eight foot sign and anything like it would be mundane, the visitor did not have to do anything, only show up. The thesis will explore the architectural problem of conveying the idea of the building, and the notification to the visitor that this idea is under their noses, scripted in architecture. The clearest predecent example of this is the Museo di Castelvecchio by Carlo Scarpa. Even here at this great museum, only is very small percentage of visitors become engaged in the building. The people who miss the building are only walking around, they were not inspired to take the time to "see". Unfortunately, much of the time the architect is merely designing architecture for architects. Out of that small group there is no guarantee that they will engage the architecture. Perhaps, the architecture has to be ultra intense to ignite the curiosity of the majority of the visitors. The rest of the people who still are not turned on, would not take the time to experience the building anyway.

A sign placed in the entry of Castelvecchio would discuss how the layers of history of the castle and of Verona are depicted through Scarpa's selective demolitions, preservations, and additions. It would request all visitors to look at how the mullions align with the turrets of the Commune Wall, and how a display of weaponry is juxtaposed to that very same wall. It would tell the story of the display of the Cangrande statue. The sign would diagram the foreshadowing of the narrowing of the second floor space. It would say how the display of each piece of artwork was designed individually. The visitors would understand, but the act of discovery would be lost. The understanding would not be as fulfilling as an architecturally didactical experience. "Stand here to see the weaponry display and the city wall" is not as powerful as realizing that standing here juxtaposes the weaponry and the wall.

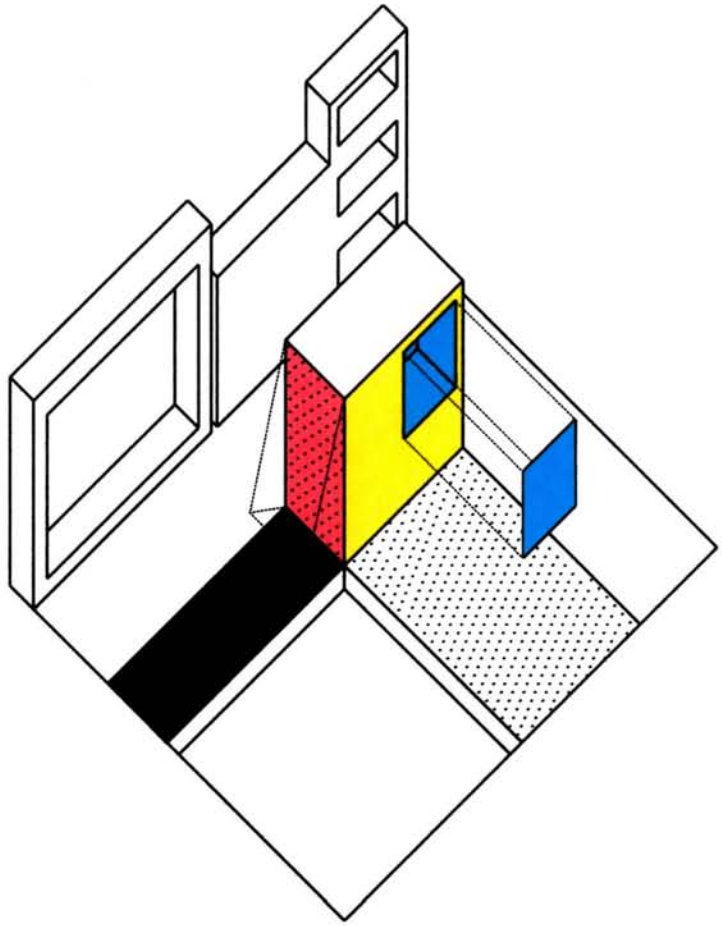
An individual's behavior in space cannot be viewed as being static, but as part of a changing didactic process. This behavior "is not initially there, at birth, but arises in the process of social experience and activity, that is , develops in the given individual as a result of his relations to that process as a whole, and to other individuals within that process." (Mead, p. 135) All individuals have the ability to learn. It is under this premise of the ability to learn that the levels of engagement were developed. Each groups would be different in amount that it could engage architecture, and on what level it could do so.

> "An ordered view of one's world- what is taken for granted about the attributes of various objects, events, and human nature. It is an order of things remembered and expected as well as things actually perceived; an organized conception of what is plausible and what is possible, it constitutes the matrix through which one perceives one's environment." (Buttimer, p. 139)

Mead discusses sociology and the role of space through "gestures." He says that gestures can reach the point of a language so that it is a significant symbol and it implies meaning. The function of the gesture is to make adjustment possible among the individuals involved in a space, which may allow for the readjustment of a gesture. (Mead, p. 46) Perhaps, the ability to read into something or the degree to which it is possible to read into something affects the response by the viewer. Human actions were based in part based on shared meanings, and that these meanings were derived from social interaction. "According to Mead's theory, variations in the spatial behavior of individuals could be seen as a function of their interaction as members within specific groups. If one accepts this premise, they must then ask if reference groups are indeed influential in dictating people's spatial patterns of behavior. Work in perception has shown that overtly expressed spatial patterns may have different meanings for different societies." (Buttimer, p. 139) The general population will be grouped in the three studies of children, adults, and architects. It is within the boundaries of these categorizations that each group will be addressed in terms of developing an architectural experience.

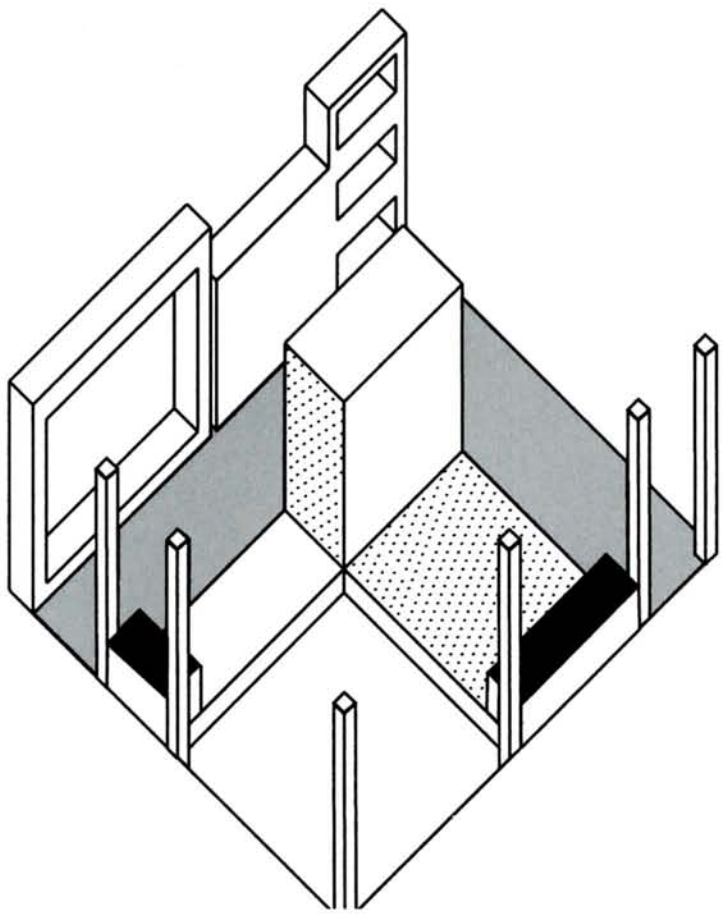
Elementary Level
Children and architecture
Study 1

It is at the early stage in life that human beings develop the sensory experience, and engage and discover the "simple sensations." (Koffka, p. 161) To develop these senses for example, teachers associate a color like green with an object like a tree. (Spodek, p. 1) Children are excited and attracted to color, texture, and movement. Vivid colors command the attention of a child. Instinctively, a child touches everything so intriguing and varying textures can excite the mind of a child. Children want to interact through the movement of various items, especially at their scale. It is these basic engagements that a child understands about architecture.



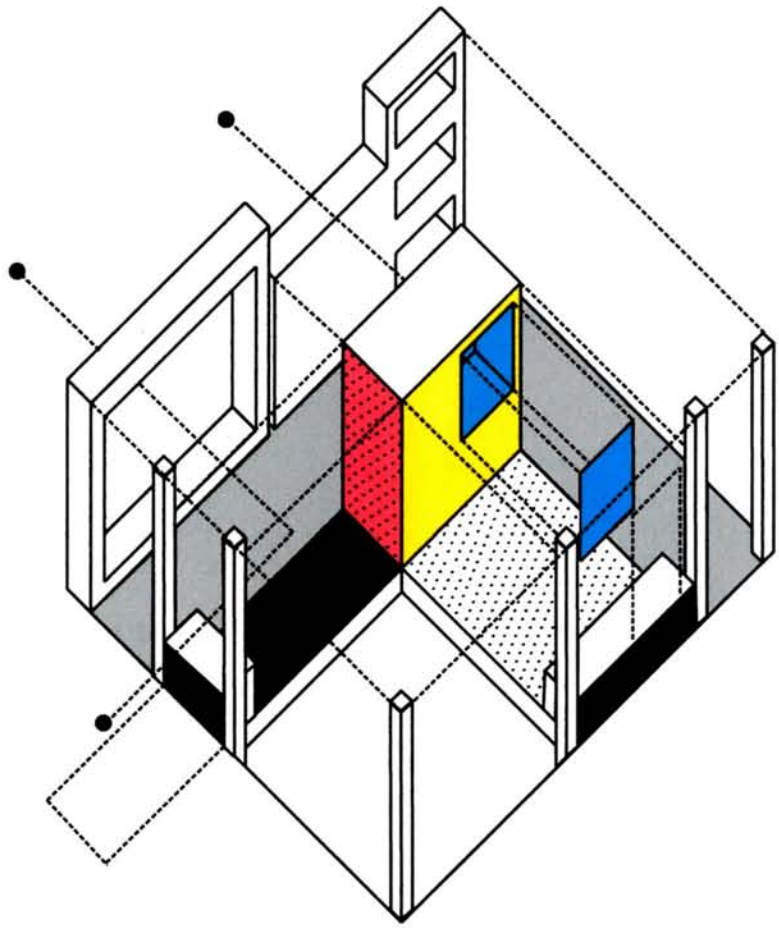
Intermediate Level
Adults and architecture
Study 2

One would have to assume that the general public can understand architectural space, and have a basic understanding of architecture. Adults can appreciate an "enjoyable space" instinctively. They might not know why the space is enjoyable, but they enjoy it nonetheless. Light, materials, and proportions may all be reasons why the average adult "likes" a space, but does not realize exactly why. They would know how a building functions in terms of circulation, and they would be able to use it. Adults would understand the purpose of walls, columns, and windows, and would have a general understanding of the structural and enclosure systems of a building.



Level of the Educated Observer
Architects and architecture
Study 3

Architects and others (artisans, historians, engineers...) Enter into the understanding of architectural space with the bias of their education. As architects, they have a much better idea about the issues that are involved in the design process. They begin to speculate as to how precedent, site, and construction inform the architectural process. Inside a building, architects look to see if space, structure, and enclosure are aligned, overlapped, juxtaposed, or a combination of all theses. They look to see if the site and landscape interact with the architecture. They speculate as to how the materiality, tectonics, and mechanical systems are being used to strength the idea of the building. Potentially, they realize how they are being manipulated through a circulation system that may be either loose or constricting. Perhaps, different material code the building systems and the joint of the materials is important in the way the building systems interact. An architect in another architect's building has the ability to grasp the theory, historical precedent, and the building systems that the non-architect (child or adult) may miss. If the non-architect does not understand, then this study becomes only for the enjoyment of the architect.



The three proposed levels vary as to part of the human experience it engages. The elementary level is for the most part instinctive. Color, texture, and movement does not only apply to the experience of art and architecture, but to the activities of everyday life as well. It is the "raw" aesthetic experience that can garner the attention of people like the roar of a passing police car, a bulldozer pushing earth, the drama of carpenters raising the wood frame walls of a house or the power of an athlete at a sporting event. More sedate activities can garner one's attention like watching the flames and burning logs in a fire or a parent watching their sleeping child. Poet, William Carlos Williams, was standing in his doorway as a fire truck drove by and was inspired to write the following poem because of the bell and siren, and the bigness and redness of the fire truck. (Hickman, pp. 6-7)

Among the rain
and lights
I saw the figure 5
in gold
on a red
fire truck
moving
tense
unheeded
To gong clangs
siren howls
and wheels rumbling
through the dark city.

Architecture is not only part of everyday life, but a reflection of it because people have the ability to respond to architecture in the same way they respond to a fire truck. So how is architecture different from everyday life, and more specifically, where is the line between art and architecture? Art may be only for display above a fireplace or in a museum. Perhaps, architecture is architecture because it is three-dimensional, however, sculpture is three-dimensional. The issue is deeper than form. A painting hangs on the wall of a museum space. The painting might be art and the museum might be architecture. The museum space is enclosed and is internalized in a way the painting never can. A painting itself can suggest space, or if the painting is moved from the wall to the center of the room, it can suggest architectural space acting as a partition. Maybe architecture is different from art in that architecture has a function or it is useful beyond art because it is more than displaying an image...then is function always useful and is usefulness a always positive? "Our utilitarian outlook has made us concentrate on activities whose ends do not serve the ultimate enhancement of the human encounter with meaning and value, and so 'we optimistically call them useful and let it go at that...'" (Hickman, p. 3) Clearly, there is room to explore the boundary of architecture because its boundary is unclear.

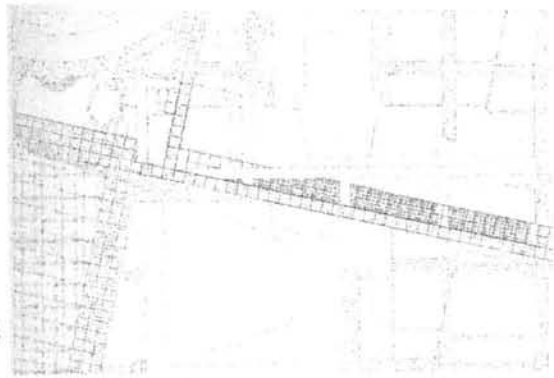
Pragmatist and organicist aesthetics

"According to Pepper, organicist aesthetics emphasizes the implicit coherence in experience on the basis of its inherent rational and internally related structure. Pragmatism, on the other hand, emphasizes that experience is dependent on the environmental context, and so may or may not be coherent. The organicist finds aesthetic value in the greater degrees of coherency while the pragmatist finds value in the intensity of the quality." (Alexander, p. 3) Dewey has been criticized in that his writings contained ambiguities and contradictions. For example, in two different quotes Dewey says that aesthetics has meaning if it is both mediated and ineffable which is contradictory. (Alexander, p. 12) Furthermore, he is criticized for his matter-of-fact tone and in the way that he feels as if he has core of the sense of an experience, and that he feels he cannot be criticized on this because he is merely "reporting" on experience. The theories of Dewey, are said to have pragmatist, organicist, and idealist qualities, perhaps these categories are interwoven and in some part exist simultaneously. (Alexander, p. 12)

The levels of engagement and the desire to translate the culture of Castelvecchio, given the above definitions, falls under both categories. It is concerned with the "degrees of coherency" and with the "intensity of the quality." There exists also the duality of the instinctiveness of the elementary level with the cultural component of the level of the educated observer. There in lies the design problem and desire of interweaving these two ideas into a the specific site and program.

The work of Edwin Luytens involved the development of a "game" through the use of paradoxical deceptions and contradictions, as opposed to the clarity and straightfowardness of Castelvecchio. The complex of Nashdom appears to be entered axially. The visitor enters the complex through the portico and crosses an external courtyard. However, the entrance is to one side of the portico. The route is off-axis to the courtyard and the axis is not regained until the visitor arrives in the winter garden on the south front. The continuity of the south facade suggests the house is one mass, however above the parapet level it is actually two pavilions through the coordination of chimneys and skylights. Furthermore, the building appears to be five stories from the frontal drive and three stories from the garden. The steeply sloping is terracing at right angles to the building, however the steepness of the site is exaggerated by the monumental staircases. (Inskip, p. 25) In Lutyens' designs, the enjoyment of the houses was that they were not what they appeared to be. The thesis, however, is interested in designing so that it is what it appeared to be.

The Wexner Center by Peter Eisenman is relevant to the discussion in the approach to the historical diagram. The genesis of the design was the discover of two grids. The site is at the edge of the Ohio State University and the city of Columbus, Ohio. The grid of the campus is cranked 12 and one half degrees from the city grid. These two grids are the generators of the project, which jams an axis between two existing buildings. (Trott, p. 9) The castle-like armory piece was abstracted and reconstructed to represent the original armory in the same location. The open frame is tilted towards the campus side of the project to represent, in section, the transition of the larger city scale down to the scale of the campus. This open frame is meant to symbolize the future of the site, suggesting that the frame will be fill with building at a later date. This set up a historical dialogue of past, present, and future in the reconstructed armory, the project as it is today, and the potential of the open frame. (Inskip, p. 28) The building is a successful diagram, but fails as a building because it was conceived as a "non-building". The display of artwork in the Center for Visual Center is difficult or impossible. The collection intended for the Wexner Center is actually display at a museum down the streets.



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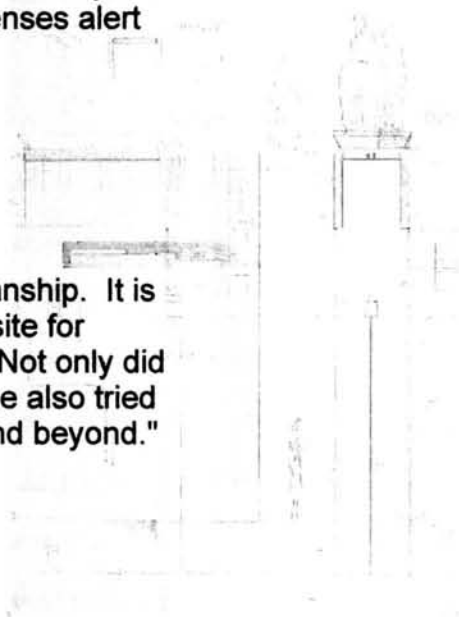
"All great buildings once visited usually exceed the expectations of the informed visitor, but rarely to the degree experienced with those of Scarpa. In his case photographs are a wholly inadequate preparation. Only directly can the rich sensory experience of his architecture be revealed: the unfolding of spaces and vista, the sounds of water, the movement of light on texture, the delight in the discovery of details, the touch of materials. To comprehend fully his genius one needs to move through his spaces with all senses alert and working together." (Murphy, Castelvecchio, p. 1)



"The absence of industrialization has prolonged craftsmanship. It is a characteristic of the city that was an absolute prerequisite for Scarpa, essential for the success of any of his projects. Not only did he demand and expect a high quality of craftsmanship, he also tried to use the same team again and again, both in Venice and beyond." (Murphy, Querini, p. 5)

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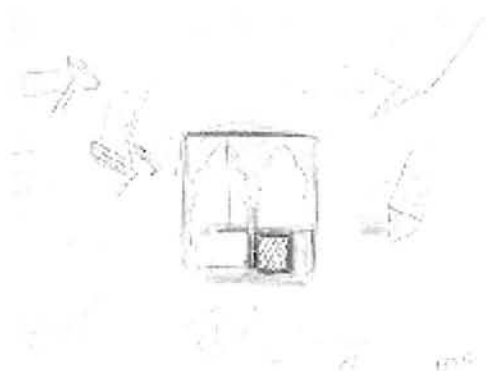
Scarpa would be continually on site during construction. He would often give a freehand sketch directly to the craftsmen.

He took great care in the tectonics of the joint. Two different materials always met at the joint with a purpose.



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These sketches are typical of Scarpa, a series of small drawings attempting to solve a condition

Here he sketches out the new window enclosure over a photograph of an existing wall at Castelvecchio

"Here Scarpa embarked on a much more far-reaching idea of not only cleaning the building but attempting to clarify and expose the layers of history by selective excavation and creative demolition. He attempted to cut and then disentangle one epoch's construction from another so that the building itself becomes a giant exhibit revealing its growth and change in nature. Scarpa was primarily interested not in any concepts of restoration but in an idea to do with historical clarity, making history visible by the co-existence of overlaying fragments of construction. To achieve this end he needed to be totally conversant with twists and turns of the castle's history. Photographs, maps and prints were studied as well as a model of the castle as it was at the end of the eighteenth century." (Murphy, Castelvecchio, p. 4)

Verona has a long history as a fortified city and until as recently as World War I, was considered a frontier city. Its location along the east-west route of Northern Italy, has made it prone to invasion. Both the growth of the city and of Castelvecchio can be seen as a series of influences of successive invaders and defenders. Three different systems of fortifications can be identified, the first of which being Roman. The Commune period as a free city republic in the twelfth century, and the Scaligeri period in the fourteenth century are the other two periods of significant occupation. It was during the Commune period that the wall across the courtyard was built. The Scaligeri family constructed the building and the bridge across the Adige River in 1354. The entire complex was built very rapidly as a safer alternative residence than their vulnerable palace in the center of the city. Castelvecchio was not built as a refuge for the citizens of Verona, but rather as protection against a possible revolt by them. The castle was built on the periphery of the city with a back door across the bridge for the purpose of a quick escape. (Murphy, Castelvecchio, p. 5)

The Scaligeri constructed the castle in two halves, a residence around an inner court and an outer military area. The military area consisted of a large area with two protective walls and a prominent tower adjacent to the river. During Scarpa's renovations of 1962, the moats were discovered and excavated, after having been filled in the seventeenth century. The moats lined the perimeter of the castle and a second moat system lined the inside of the military area adjacent to the Commune Wall. This is the moat that the statue of Cangrande and his horse is cantilevered over. A long period of relative peace ended with the fall of the Venetian Republic and Verona to France under Napoleon in 1797. A revolt against the French invaders two years later, resulted in damage to the walls and the tops of the towers. After that encounter, the French fortified the castle against the Austrians camped on the other side of the river. The last significant occurance before the opening of Castelvecchio as a museum in 1923, was the opening of the road through the castle and across the bridge. This opening of the road in 1825 was the first time that Castelvecchio was "opened" to the city. (Murphy, Castelvecchio, p. 6)

The designing and construction of the revamped museum was carried out in multiple stage between 1958 and 1973. A large part of the success of the museum was due to the working relationship between Scarpa and Licisco Magagnato, the museum director appointed in 1956. He admired Scarpa and trusted his talents as an architect, and shared in his love of art. During this gradual fifteen year process, the two managed to preserve and unfold the historical layers through renovation and demolition. For example,this included the stripping of the nineteenth century ornament in the galleries and the development of the courtyard as an exterior gathering place. The most drastic moves was the relocation of the entry and the development of the Cangrande space. (Murphy, Castelvecchio, pp. 2-3)

Cangrande space along Commune wall and moat

In the 1923 design of the museum, the entry was located on the now Cangrande space side of the courtyard facade. Scarpa moved the entry to rearrange the sequence of gallery space. A series of courtyard elements mark the sequence from the openings in the Commune wall to the entry, the last of these elements is the sacello, a tiled rectangular volume which punctures the courtyard facade. As witnessed by the extensive sketches of possible solutions for the display of the Cangrande statue, the location and display of the statue was a critical move. It was here that Scarpa made his most drastic demolition, which consisted of the whole end bay as well as a Napoleonic grand stair that abutted the end bay. The demolition created the space for the statue, but also separated two eras in the history of the Castelvecchio between the Commune wall and the gallery building. (Murphy, Castelvecchio, p. 8)

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Where the forced perspective reopened at the "last bay"

Bridge across the Adige River, opened to the city in 1825

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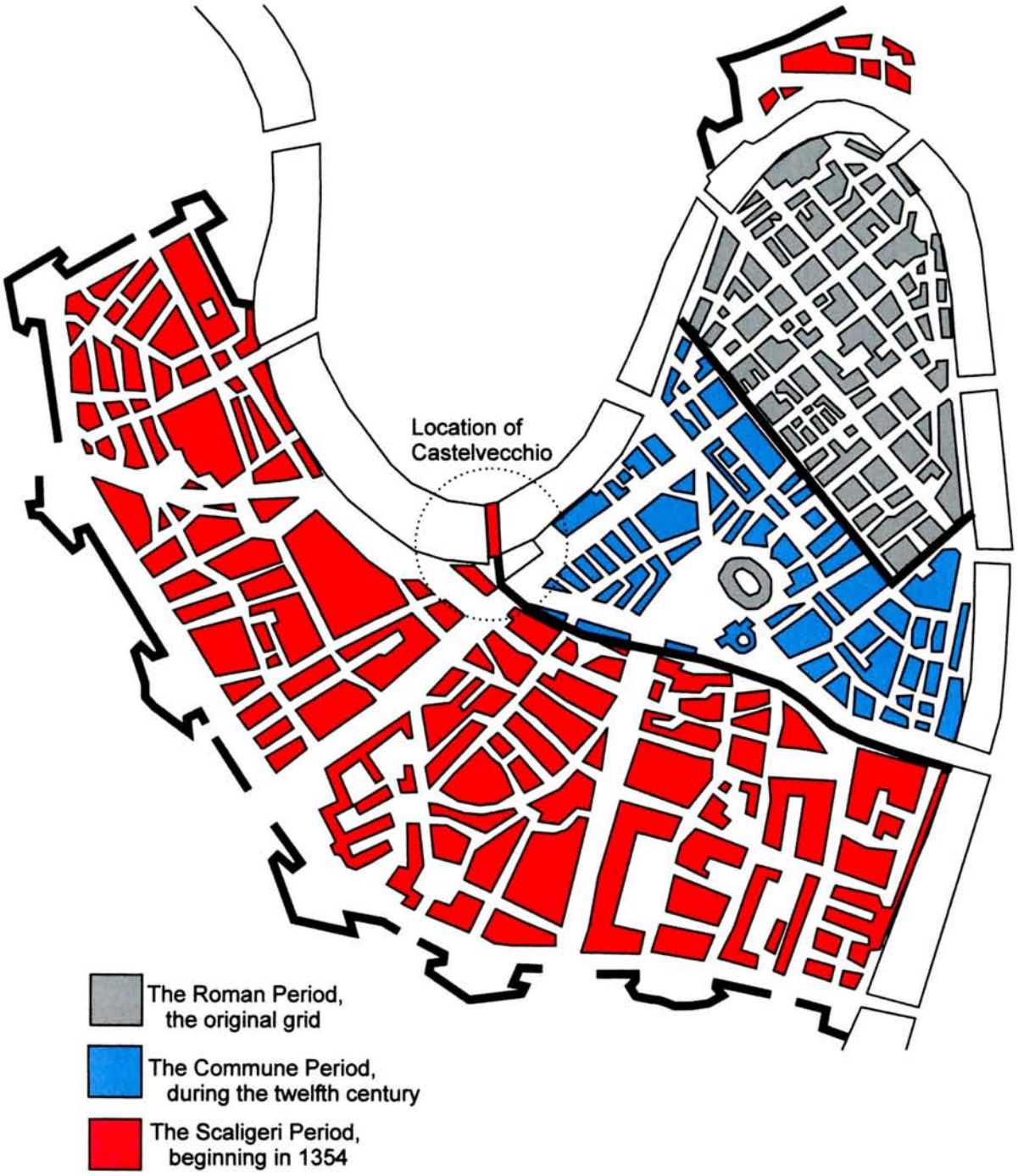
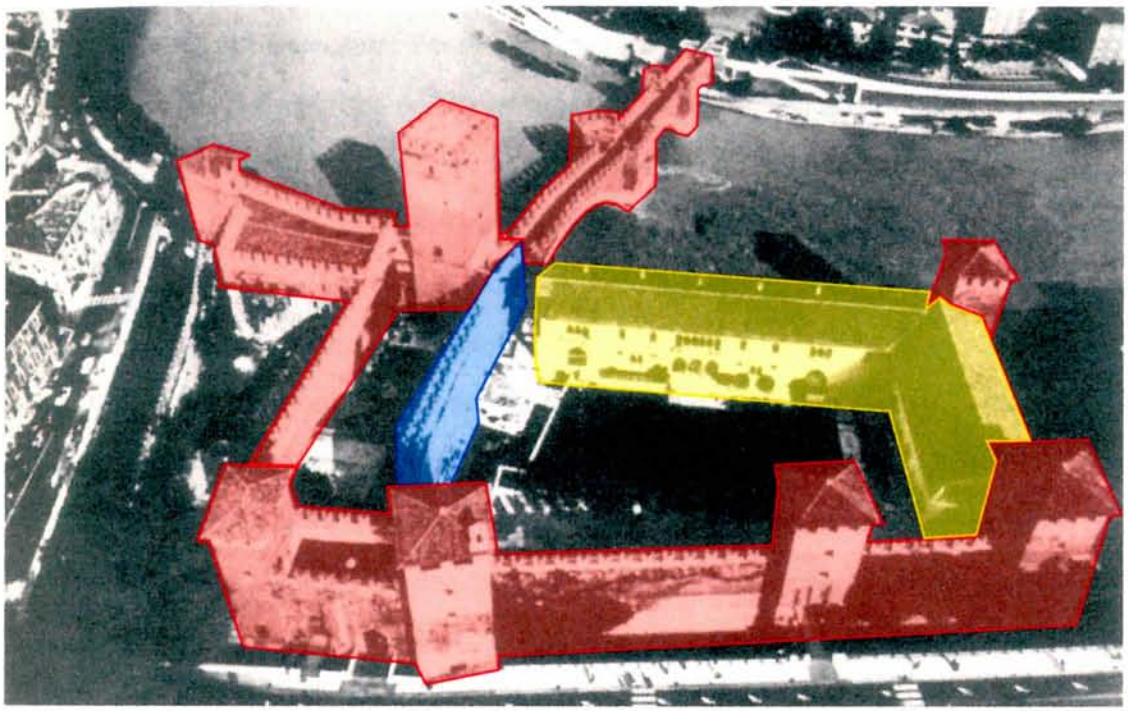
On axis in the first floor galleries


Location of
Castelvecchio
The Roman Period,
the original grid
The Commune Period,
during the twelfth century
The Scaligeri Period,
beginning in 1354



The Commune Period,
during the twelfth century

The Scaligeri Period,
beginning in 1354

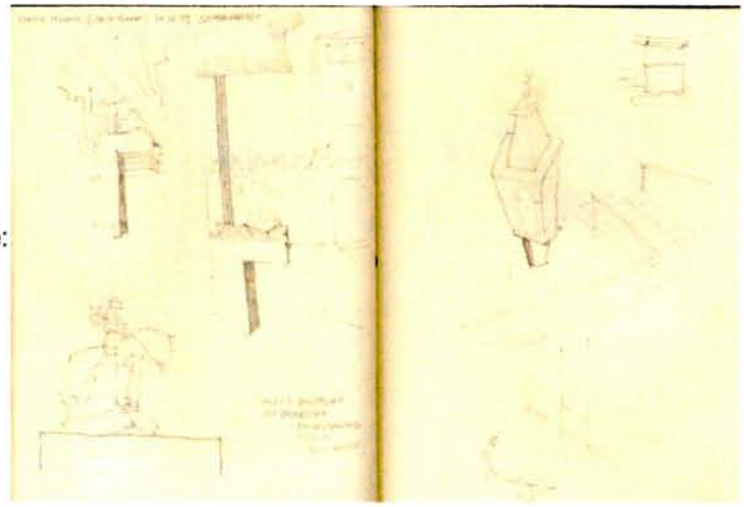
The Napoleonic Period,
beginning in 1797

The Experience

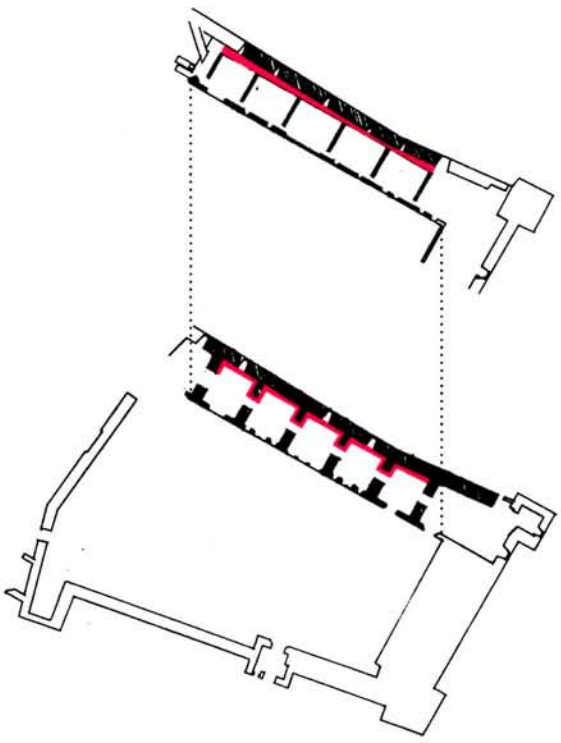
During the afternoon I visited the Castelvecchio in Verona, I walked through the museum maybe a dozen times. Each time through I realized something that Scarpa intended to show all visitors, until I felt I understood this building and the "game". He wanted to engage the visitor in the artwork displayed, show how he intervened into the existing structure through materials and details, and also allow the historical significance of the site to be apparent. For example, the mullions in the windows of the first floor appeared to be random, but when I stood in the door opening of the last gallery space on the first floor the mullions aligned with the turrets of the city wall across the courtyard. The same moment appears in the first gallery when one looks through the window above the sacello, the rectangular volume that punctures the wall near the entry.

On the second floor, a display of weapons is juxtaposed to a view of the city wall to develop a didactic connection between the weapons and the battles fought in years past. Also on the second floor, the walkway that connects the galleries is a forced perspective, with the last "bay" above the entry opening back up.. He foreshadowed this move on the first floor galleries directly below by carving the gradual shrinking of space into the floor along that wall. He designed how each item in the museum was to be displayed, and how the visitor is to move around the object. Scarpa made one painting a partition by permitting the wooden back of the painting to be seen. A small painting is placed back on an "easel", the way the display easel was constructed highlights key areas of the painting and its proportion. A staircase winds around a sculpture to allow the visitor to experience it from new angles. The recognizable statue of Cangrande on his horse acts as a point of reference, as it disappears and reappears along the sequence. All of these individual moments add up to an understanding of the purpose of this building and its relationship to the artwork and the history of the site.

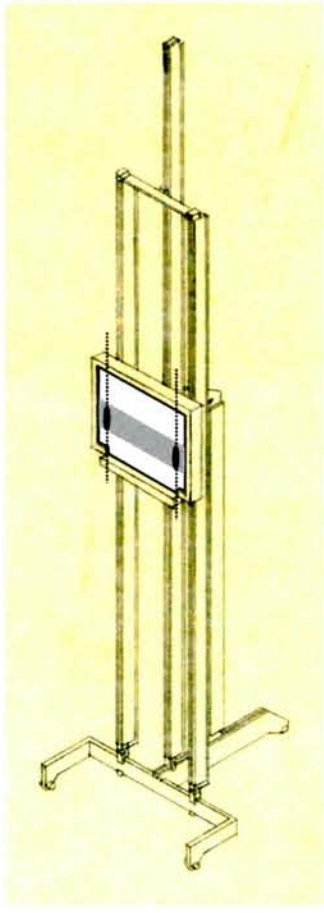
Point of reference: varying views of the Cangrande



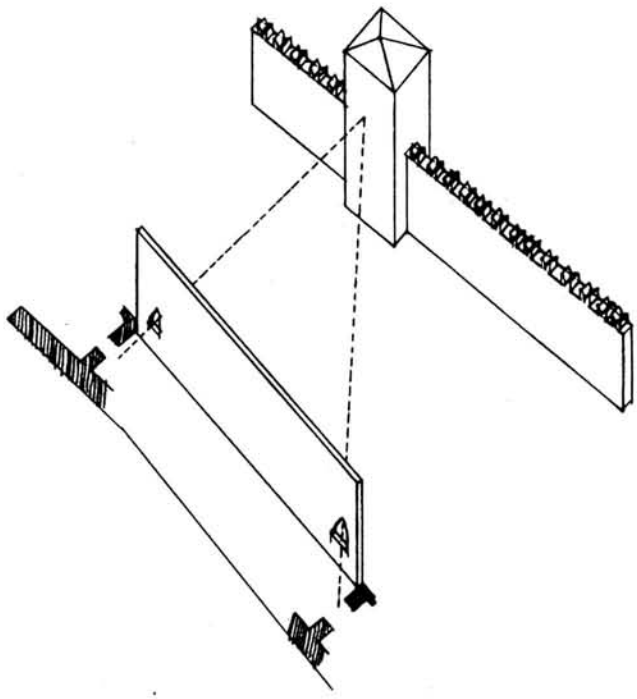
Showing movement of display sequences



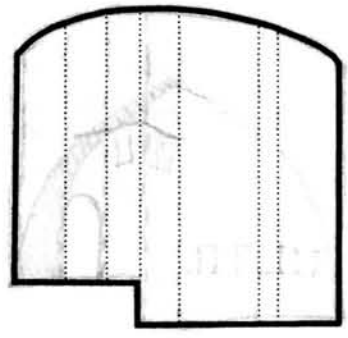
The triangular carvings into the first floor, foreshadows the narrowing of space on the second floor.

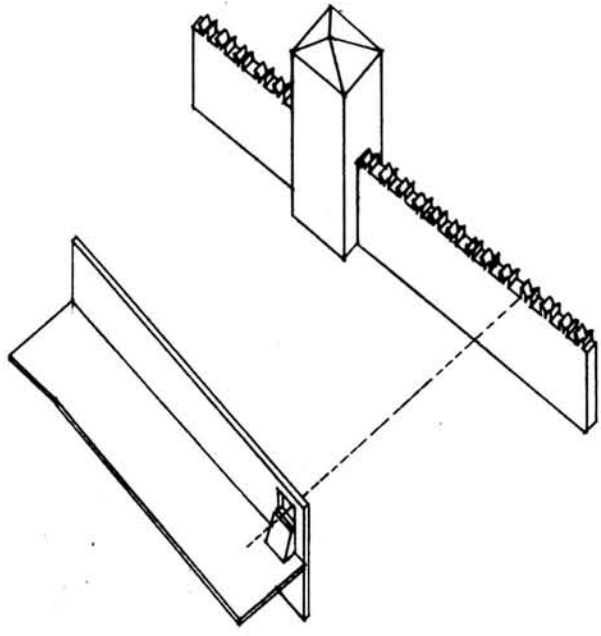


The display "easel" interacts with the painting by aligning with the composition of the painting.



The mullions of the windows of the two end galleries on the first floor align with the edges of the tower and the wall.



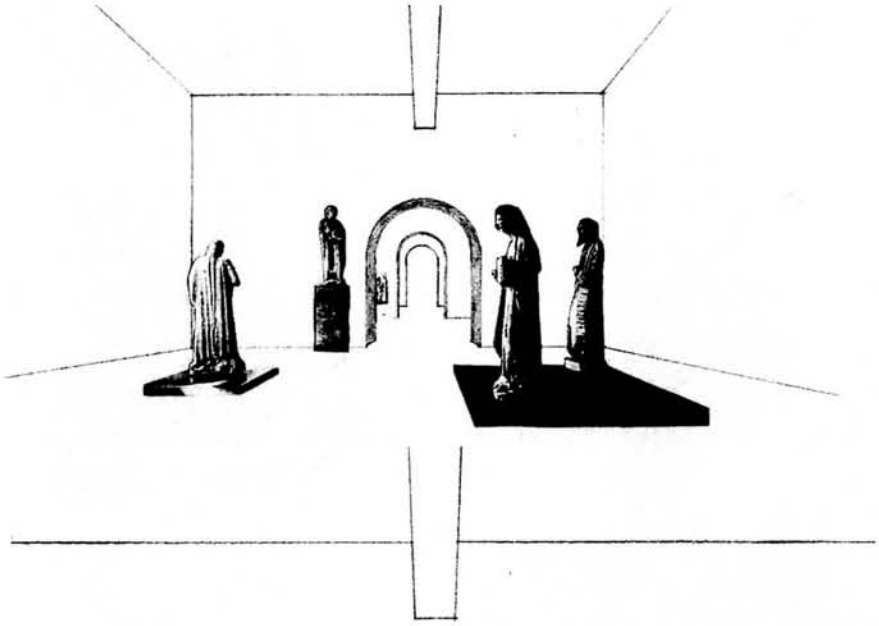


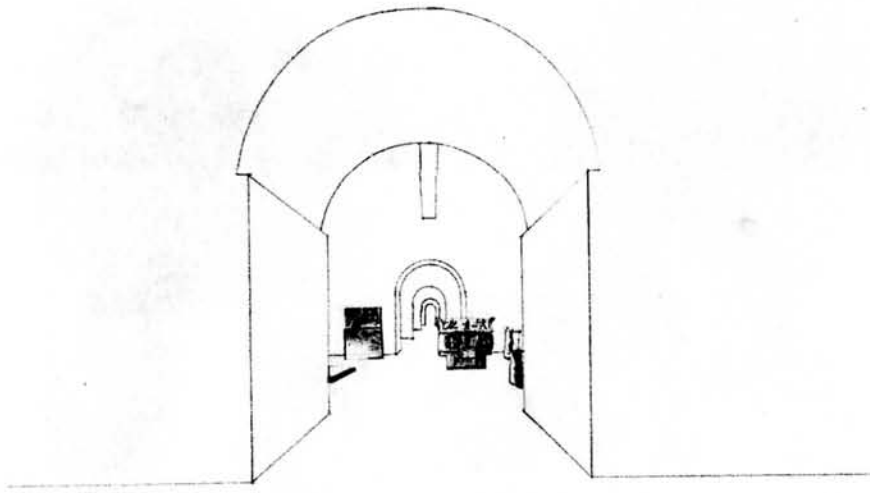
The display of weaponry on the second floor is juxtaposed to a view of the Scaligeri wall.

The following series of diagrams begin to speculate in the realm of the "educated observer" as to how or what reveals that the museum is meant to be engaged.

Selective Intensity

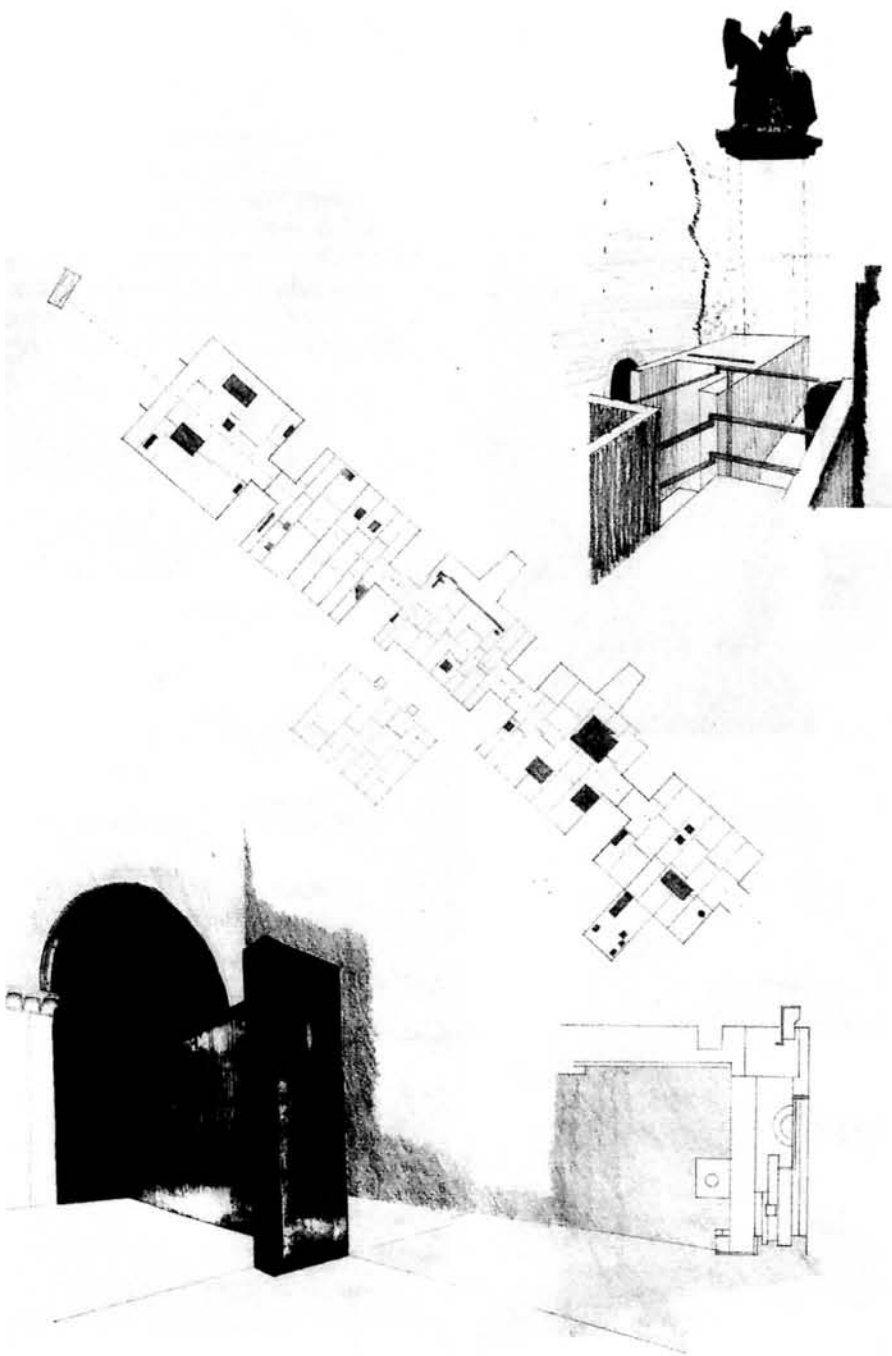
Through placing the artwork and the architectural elements against neutral backdrop, the realization that the sequence is didactic might be realized. If the entire building embodied the intensity of the insertion and the individual moments, maybe realization would be lost.





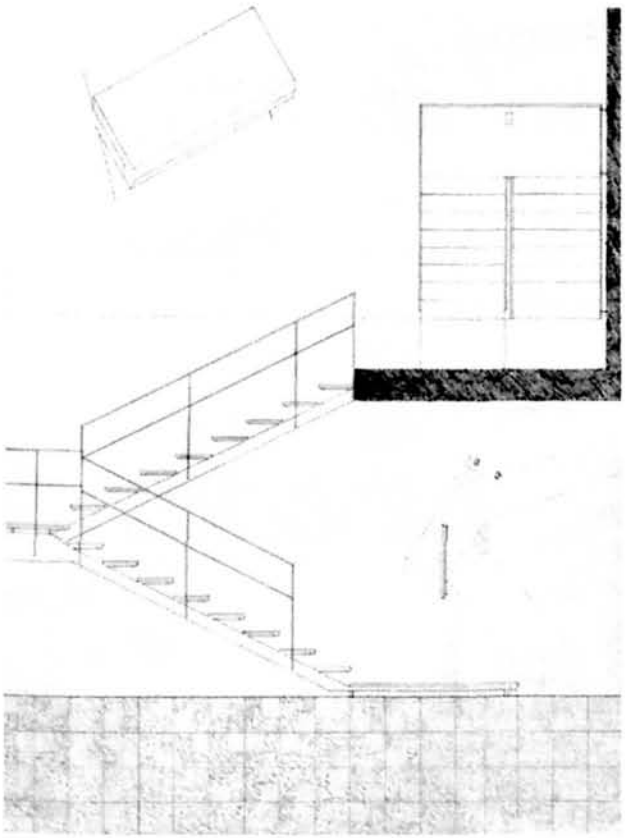
Areas of Rest/Reflection

An endless pursuit of engagement might prove to be tiresome. The Cangrande statue space and the courtyard are areas that provide rest and reflection about the sequence that was experienced.



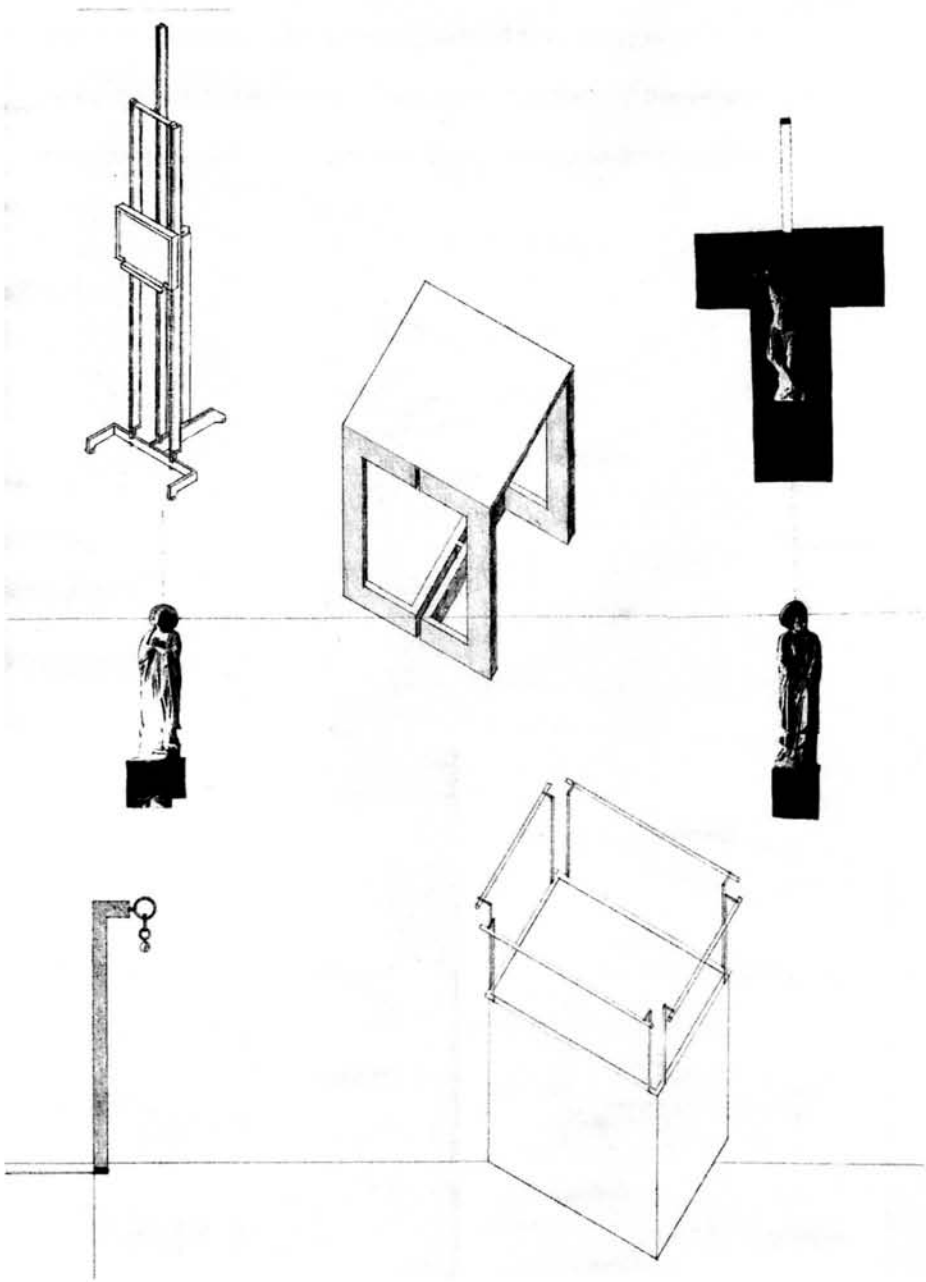
In the Details

It is evident that every connection, and display was designed by Scarpa. An architect's attention to detail might make a visitor to not only look at the details, but to look to see if other elements are as controlled and designed as the details. A visitor may begin to be engaged because of the realization that the architect is controlling the situation.



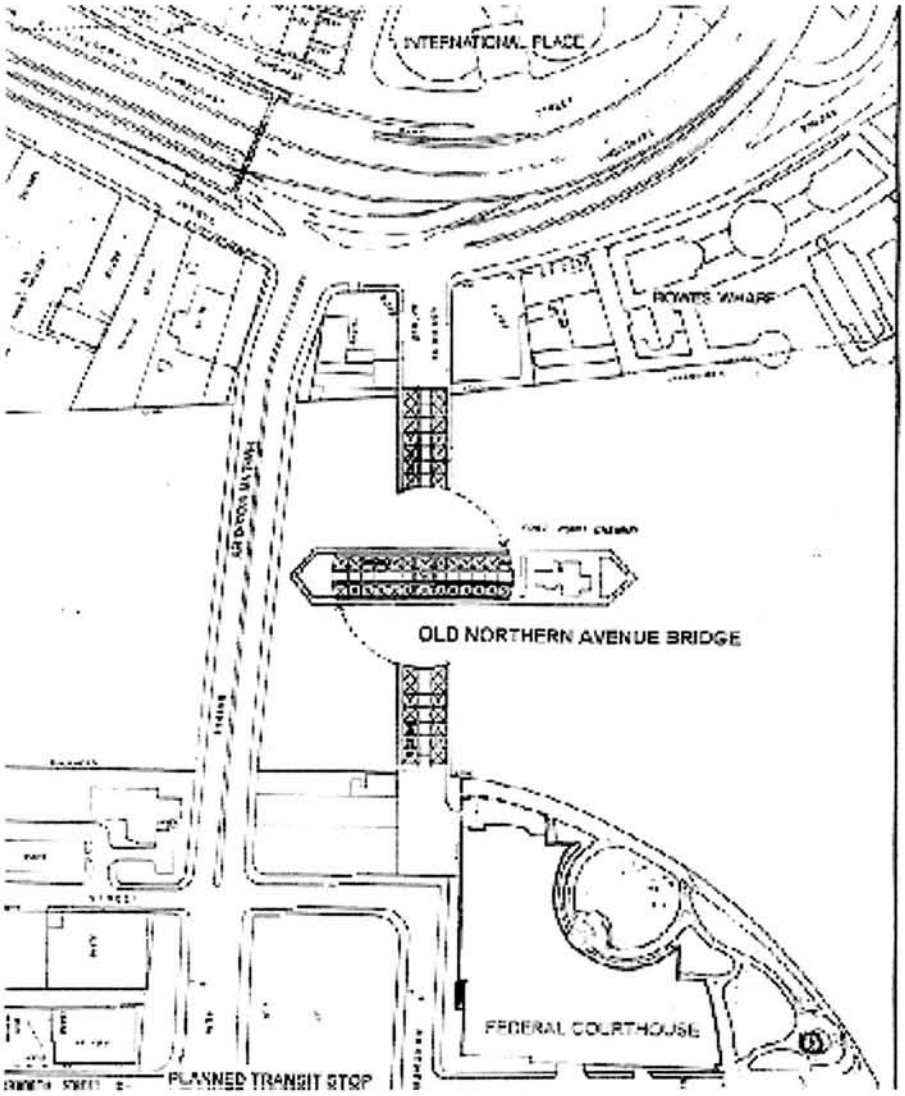
Details of display, function, and surface

Details of display



Railing around a display
in the floor which is
under glass

A majority or the entirety of the program will be injected into the existing structure of the bridge. The Old Northern Avenue Bridge is shown in the open position. The swing section of the bridge is an opportunity to investigate the positioning of this span, the form of the project, and possibly establishing a reconnection of the pedestrian walkway.

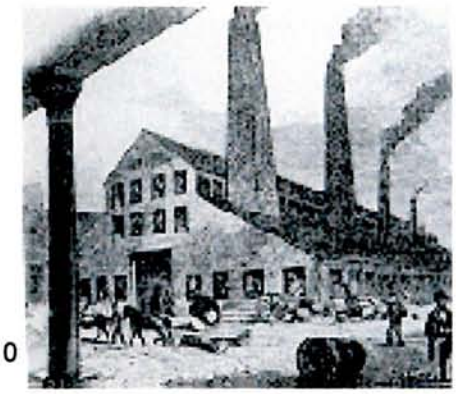


Historical Significance of the Area

Throughout the history of the city, Boston has sustained itself through its relationship to the ocean. The settlement of the city on the Shawmut peninsula was, in part, because of the potential of the water to be used for shipping, transportation, and defensive reasons. The city has developed over the last 350 years, but has not been completely rebuilt allowing for a reading of its historical context through its mere existence in the present state. The cow paths of the colonial era became the narrow, curvy streets of today. The brick and cobblestone streets of the historical center remain in juxtaposition of the asphalt roads of the Back Bay and the South End. The Boston Common was a grazing area for livestock in the colonial era, now it functions as a public park. The brick statehouse by Charles Bulfinch and the rusticated brownstone Trinity Church exist under the steel and glass skyscrapers of the Back Bay.

9

Like the Back Bay, much of the Seaport area has been infilled. Much of the area was originally tidal marsh, with South Boston a peninsula of about 600 acres separating Boston Harbor and South Bay from Dorchester Bay. During the Colonial era, South Boston was home to several large farmsteads, and during the Revolutionary War was the site of several important battles including the Battle of Dorchester Heights where Telegraph Hill and Nook Hill were used as important fortifications.



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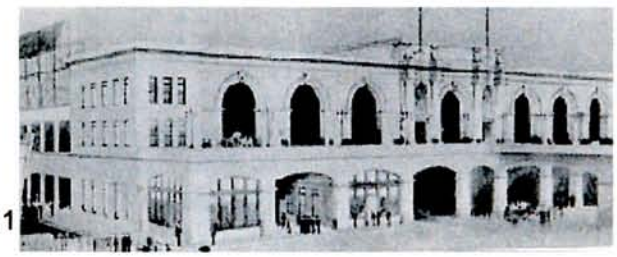
South Boston Iron Company, 1812

In 1804, South Boston was annexed to Boston and landfill created new sites for commercial development. The South Boston toll bridge opened the following year to connect the area to the rest of the city. Major industrial activity began after 1810 with the establishment of The South Boston Iron Company, which dominated industrial life of that area for the first half of the nineteenth century. The first shipyard and glassworks facilities were built in 1812. These three industries dominated growth throughout this period, with brick-making kilns developing to a lesser extent in the area.



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Commonwealth Dock Head House, 1915

In 1804, there was 60 documented families living in the area. With the opening of the North Free Bridge in 1828, residents of Boston began moving to the South End in large numbers. By 1830, the population had reached 2,200 and by 1850 it had grown to 13,000. After the introduction of an aboveground railway system in 1854, the rate of the population increase became even greater. The industrial expansion caused by the Civil War also attracted skilled workers to the South End between 1850 and 1870, tripling the population to 39,000. (O'Brien, p. 9)

Additional space was needed for the new development leading to extensive landfill operations. In 1833, 75 acres of mud flats were filled for a large railroad terminal for the Boston and Worcester railroads. Eleven wharves were added to create additional land as well. The Boston Wharf Company began a series of landfill operations along the Fort Point Channel, which were completely carried out by the end of the nineteenth century. The Fort Point Channel itself was laid out and the first granite seawalls were constructed in 1837. The channel gradually filled with a series of bridges from 1871 to 1908. The final bridge constructed at this time was the Northern Avenue Bridge built between 1905 and 1908. (O'Brien, p. 10)

The population of South Boston began to decline around 1895, after the dramatic boom caused by the Civil War. Most of the previously dominated industries declined. The increasing cost of shipping coal and iron to Boston from other parts of the country, caused most of the iron factories and glassworks to close by 1880. The South End was shifting from an active trading port to a center for steamship and railroad ferry terminals. As factories and warehouses closed, employment patterns started to change from the factories to the shops and stores. A large part of the re-growth of industrial South Boston in the twentieth century was due to the opening of the Gillette Razor plant in 1905 and the consolidation of Boston's fishing fleet into the South End. (O'Brien, p. 10)

Materials of Surrounding Surfaces

Rusticated granite wharf facade with brick sidewalk on water's edge

Cobblestone edge

Old Northern Avenue Bridge

The Northern Avenue Bridge is an "operable steel three-span, triple-barreled, Pratt-type through-truss bridge. The center span is a rim-bearing swing bridge." (Lipsey, p. 8) William Jackson, the City Engineer for Boston, designed the bridge. The bridge was designed for the use of carrying horse-drawn and motorized trucks through the outside barrels, train passage through the central barrel with pedestrian passage on sidewalks cantilevered beyond the outside barrels across the Fort Point Channel. The bridge was created between 1905 and 1908 to serve oceanfront industrial needs related to the developing port of South Boston. The bridge is currently used as a pedestrian crossing, with an adjacent bridge assuming the function of transporting vehicular traffic. The swing span is still able to open as evidenced by the bridge opening in 1989 photographs. According to a July 1992 inspection of the bridge done for the city, the bridge was declared to be in fair condition, with the major problems being underwater with the deterioration of some concrete and massive marine growth.

The bridge foundation was constructed and embedded in the clay that underlies the silt at the bottom of the channel. The four piers and two abutments are set on concrete foundations supported by wood piles, the pine formwork for the concrete remains. The piers are finished with rough quarry faced granite blocks. The fixed spans are supported by an abutment and one pier on the Boston side and by one abutment and two piers on the South Boston side. A circular pier at the center supports the swing span. The planned load requirements for railroad use made this draw span unusually strong for a swing bridge.

Old Northern Avenue Bridge
View looking towards Boston

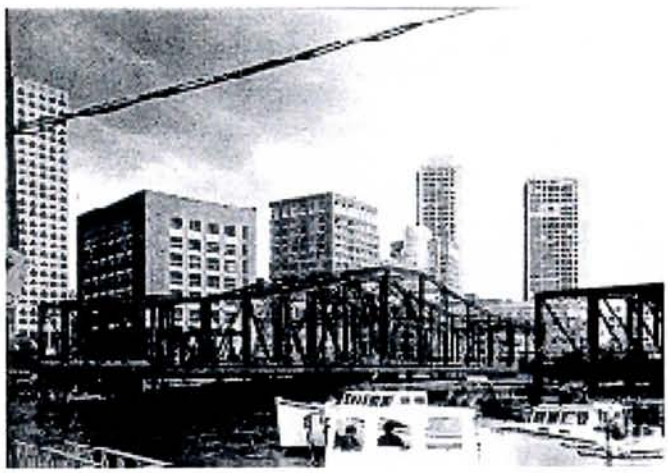
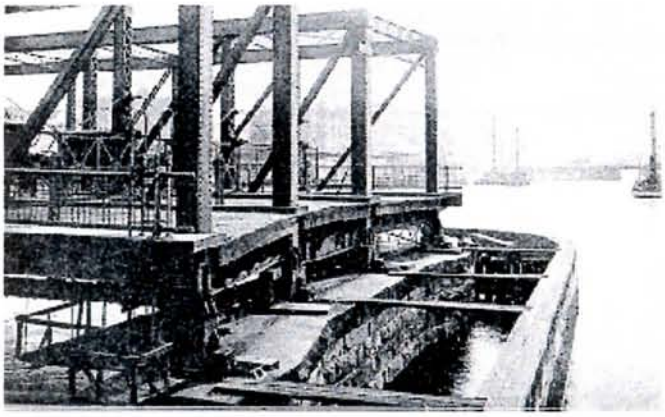


Photo taken on 7/1/1989 during inspection of the bridge in the open position

Besides being the final bridge across Fort Point Channel necessitated by the development of South Boston as an industry and railroad transportation center in the nineteenth century and important port and distribution center in the early twentieth century, the Northern Avenue Bridge was made necessary due to the construction of South Station. The completion of the station resulted in increased traffic across the channel. Several bridges were constructed in the area, including the Summer Street Retractile Bridge in 1899. However, the slope of those bridges was too sleep to allow easy vehicular and horse-drawn passage. Northern Avenue and the Northern Avenue Bridge created a passage in the northeast section of South Boston across the channel at grade. (Lipsey, p. 12)

View towards the courthouse and South Boston

View towards adjacent skyscrapers in Boston



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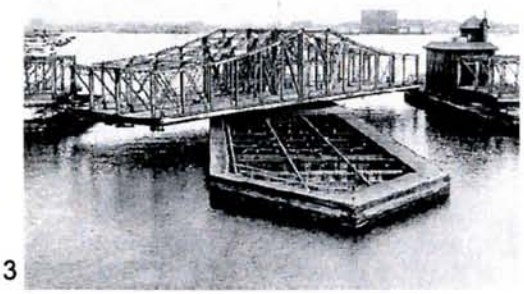
View of fixed span while the bridge is in the open position,1909



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Northern Avenue Bridge swinging open on central pier, 1909

A "through" truss bridge means that the parallel trusses are braced laterally at the top to allow passage "through". "A Pratt truss is typified by heavy vertical bracing, operating in compression, and lighter diagonal bracing, acting in tension, thus creating a system of stable interlocking right triangles that distribute the forces of the load of the bridge into the system of the truss."(Lipsey, p. 5) The superstructure was assembled by connecting immediately adjacent columns through the use of criss-crossing lattice-like metalwork. The ends of the swing span are curved to allow the swing span to open and close, in the same manner that a door needs to be chamfered to allow it to enter into the jamb.

The swing span operates by pivoting on the circular pier on a ring of 56 steel wheels. The draw is turned by two double-cylinder engines attached to the draw. A system of compressed air operates the draw span. There are eight end lifts, one at the end of each truss. The end lifts act together to release the swing span from the fixed spans when the bridge is in the closed position. The draw tender's house is a small wood-shingle structure constructed to house the air compressors and act as a residence for the draw tender, who would need to be on location to operate the bridge. (Lipsey, p. 9)

Column with joining metalwork

Join between the fixed span and the swing span

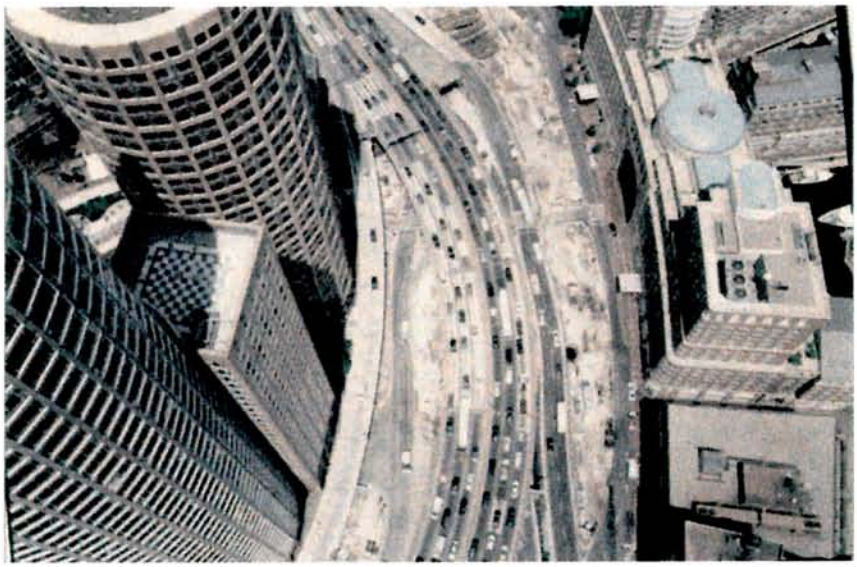
View from left barrel towards South Boston

Map of Boston and Dorchester before Dorchester was annexed to Boston in 1804

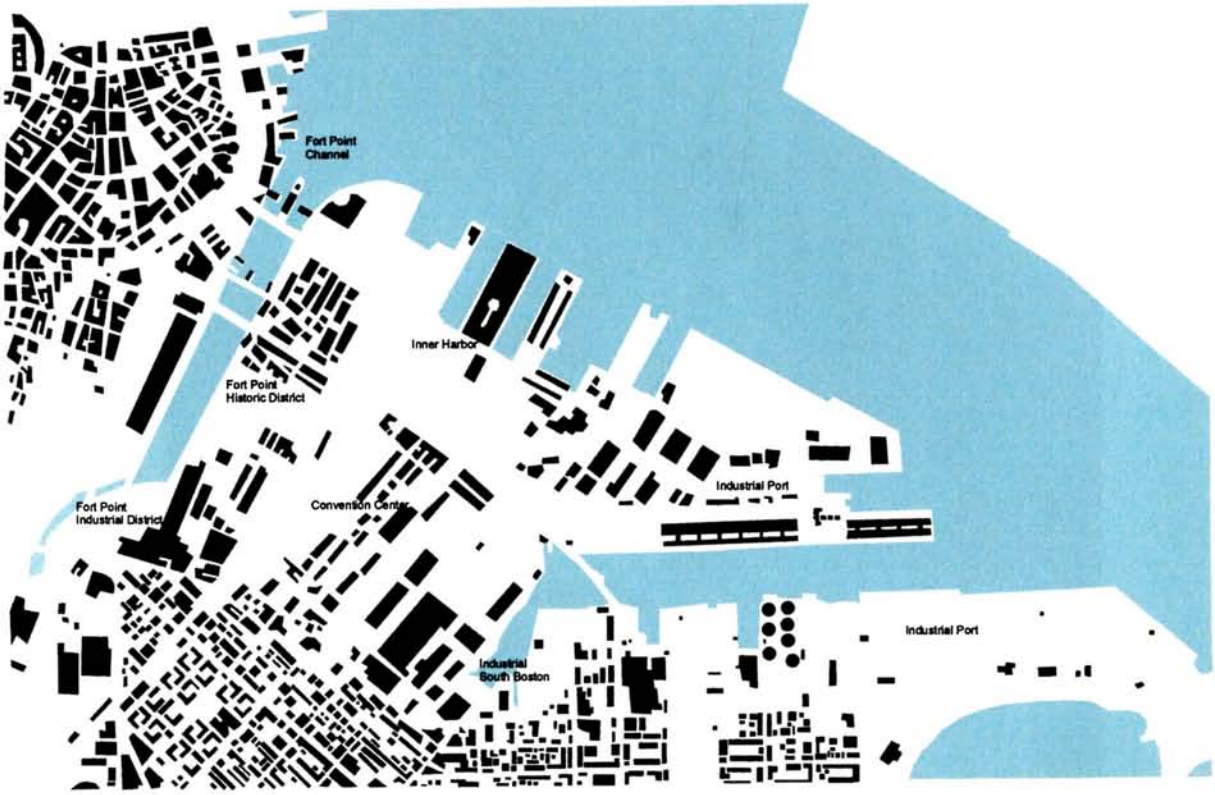
The Past State: as a colonial trading port

In 1804, South Boston was annexed to Boston. Much of South Boston was barren mud flats, and legislation was passed to infill that land so that commercial development could ensue. The Fort Point Channel is a constructed condition, shaped by Boston's industrial and economic development in the nineteenth century. A series of bridges were built to accommodate the growth in the area. The last of this bridges was the Northern Avenue Bridge which was completed in 1908.

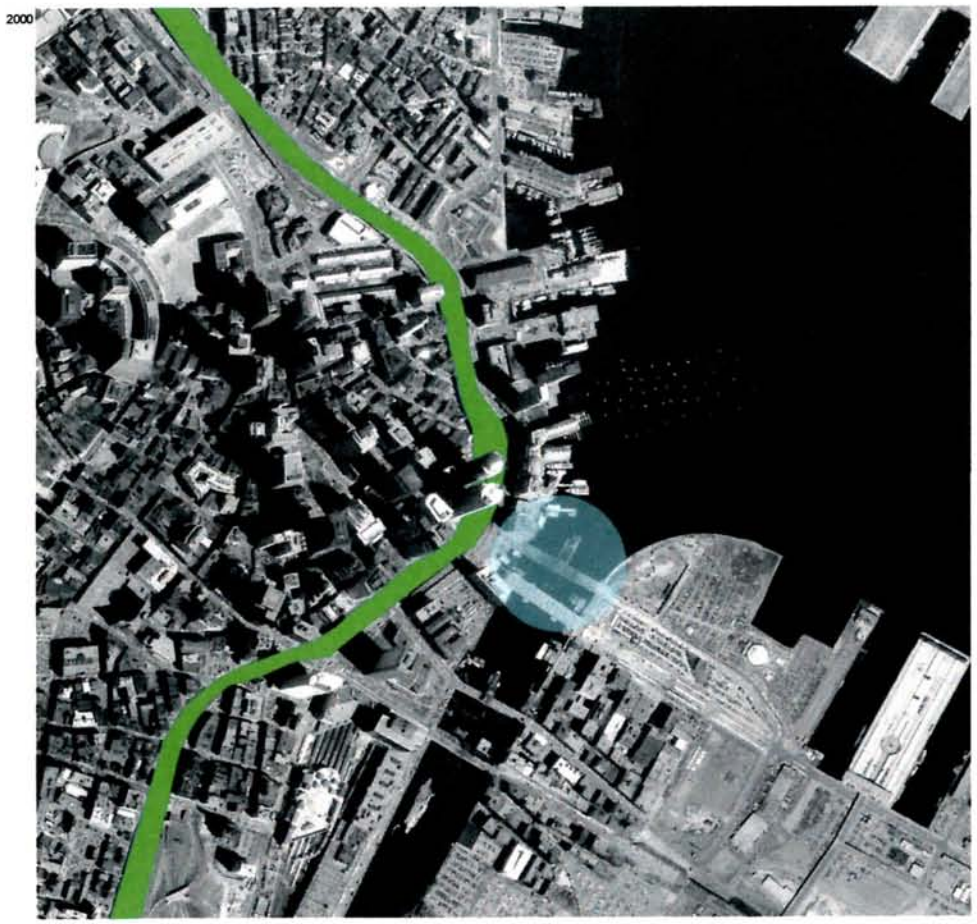
Route 93 as it exists today between International Place tower and the water. The Northern Avenue bridge is just out of view to the right.



The Present State: as a product of industrialization



The Future State: After the completion of the "Big Dig"



A Didactic Center:
in collaboration with the adjacent Children's Museum

Programmatic Intent

The levels of engagement and the translation of the elements of Castelvecchio will act as vehicles that inform the program and not as program itself. The program acts as the framework through which the didactic condition is realized. Today, the bridge acts as a pedestrian walkway. The project will respect that function of the bridge.

Effect of the site on the program

The project has the potential to exist on, in or adjacent to (or a combination of all three) the Northern Avenue bridge. The bridge functions as a means of connecting Boston and South Boston. It exists in between several different building typologies; a courthouse, two fishing companies, a Coast Guard administrative building, several office towers, and a children's museum. At some level the site, acting as a connector, must accommodate its surroundings. However, with regard to function, the project will be most closely linked to the children's museum.

Footprint

swing span	15,900 sq. ft.
Boston-side fixed span	8,300 sq. ft.
South Boston-side fixed span	8,300 sq. ft.
Total footprint	32,500 sq. ft.

Volume

The highest point of the bridge is 43' from the walkway to the top of the arc on the swing span. If the project does not exceed that point, than the absolute maximum volume of the project would be 1,397,500 cubic feet.

Total footprint	32,500 sq. ft.
Maximum height	43 feet
Maximum volume	1,397,500 cubic feet

Program

Parking

Parking will not be considered due to the large amount of parking, which services the nearby courthouse, industrial areas, and the fishing companies. Furthermore, it is expected that a majority of visitors would arrive on foot or via subway or bus.

•Follies/Park	10,000 sq.ft.

These exterior elements and the connections between them engage persons on the pedestrian walkway as a separate sequence to the Didactic Center.

•Exhibition space (3 galleries @ 4,000 sq.ft.)	12,0000 sq.ft.

Here the galleries will vary as to what level they are engaging, and in the means of making the galleries inactive and realized.

•Video visual room (100 people)	2, 500 sq.ft.

An internalized space for video displays

Exhibition preparation/ exhibit storage space	2,000 sq.ft.
•Entry	1,000 sq.ft.
•Ticket office	200 sq.ft.
•Restrooms (4 @ 500 sq.ft.)	2,000 sq.ft.
•Seafood Café/ Restaurant	2,500 sq.ft.
Subtotal of interior spaces	22,200 sq. ft.
Circulation (15%)	3330 sq. ft.
Total interior space	25,530 sq. ft.
Total space including Follies/Park	35, 530 sq. ft.
Mechanical Space (30%)	10,659 sq. ft.
TOTAL	**46,189 sq. ft.**

Ponte Vecchio

Ponte Vecchio is a bridge in Florence, Italy over the Arno River. The bridge has a function beyond pedestrian travel. Both sides of the bridge are lined with stores, most of which are jewelry stores. Furthermore, the Vasari corridor passes over the bridge at a higher level. This passage was constructed by the Medici family around 1570. It allowed for the powerful family to have a safety route from the Uffizi out of the city if a revolt broke out. Currently, the Vasari corridor is home thousands of pieces of artwork, which are rarely availale to be viewed by the public.

Thermal Baths at Vals

The bath is a sensory experience. Through the use of varying degrees of water temperature, light, texture, and scent, Zumthor engages the senses of the bathers. The bathers get to experience the hot, cold, and medium temperature waters. The sauna room is almost pitch black as compared to the exterior pool in the sunlight. The stone floors are smooth under the feet of the visitors, while the coursing of the stone walls is rough to the touch. Some of the smaller rooms had other themes like the scent of flowers or "pasta-like" items floating in the water that were illuminated by floor lights. (Zumthor, p.138)

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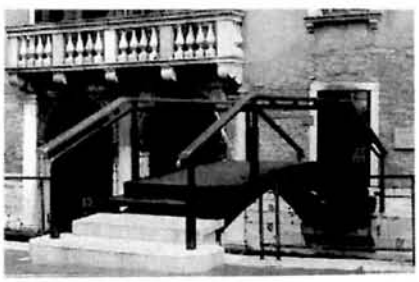
16

Querini-Stampalia in Venice

17

Clearly Venice is like no other city, Italian or otherwise. The complex matrix of interwoven streets and canals wind through the city. The architecture itself is of another language than that of Florence or Rome, due to the fact that Venice was not controlled by the Romans. The city is built upon wooden piles driven into the ground under the moderately shallow water. Over time, some Venetian buildings sink in the water. The water level is at the midpoint of some stories, and new stories are added to the top of the buildings that had the lower stories claimed by water. Venice is largely at the mercy of the sea, due to seasonal flooding. Often times rising waters flood the Piazza di San Marco. When Carlo Scarpa redesigned the Querini-tampalia, his major "game" involved the rhythmic waters of Venice. (Murphy, Querini, pp. 6-9)

Scarpa conceived of the building as a slab, which could be allowed to be flooded by the water from the adjacent canal. The penetrable watergate introduced the flow of water directly into the building through the metalwork. The two arched gates are lined with identical steel and brass hinged grilles. The central bay in each arch is raised up to symbolically invite the water in as in the above photograph. The metalwork reflects light and casts shadows onto the water. Floor lights were added so that the rippling of the water projected on the ceiling at night. In the garden, water is further manipulated. A canal connects the collective sitting area to the well. Towards the well, a mechanism was designed to make the falling of the water have a particular sound. In the middle of this sequence is a raised alabaster sculpture. This tiny, labyrinth-like sculpture is meant to be a metaphor for the "sources of water" in Venice. An assymetrically arched bridge spans the canal in front of the museum. Scarpa separates the arched structure with the function of the stairs. He is attempting to express through the bridge, the horizontal plane of the mini-piazza in front of the canal and the verticality of the facade by piercing the window opening. This window opening acts as entry, and as Scarpa says "activates the window." (Murphy, Querini, pp. 10-17)



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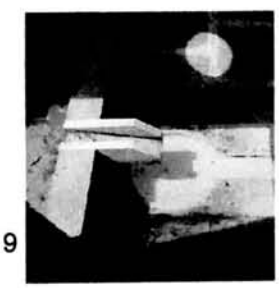
Clear separation of the arch and steps as the treads are articulated as independent of the arch

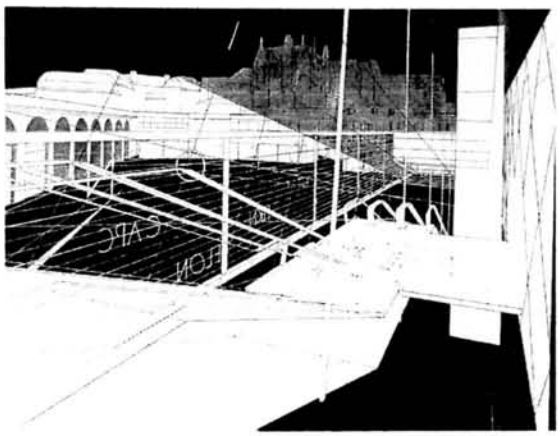


19

Depiction of the movement and sound of running water in a small detail

Bridges at Lausanne

This Steven Holl project began as an anonymous competition of a series of mixed spaces on five different bridges. The program consisted of about one third commercial, one third housing, and one third offices. One bridge had a museum with another having a cinema with adjacent office space for a local university. The Metropont bridge had retail and office space. There was also the idea of creating a park, so Holl tried to combine the functions of parks and bridges. Bridges could potentially contain the same activities as parks and become areas of public activity. (Futagawa, p. 112)



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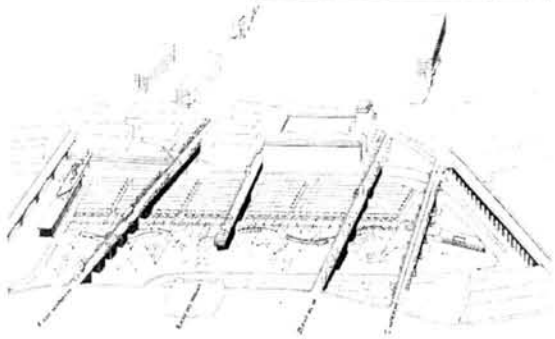

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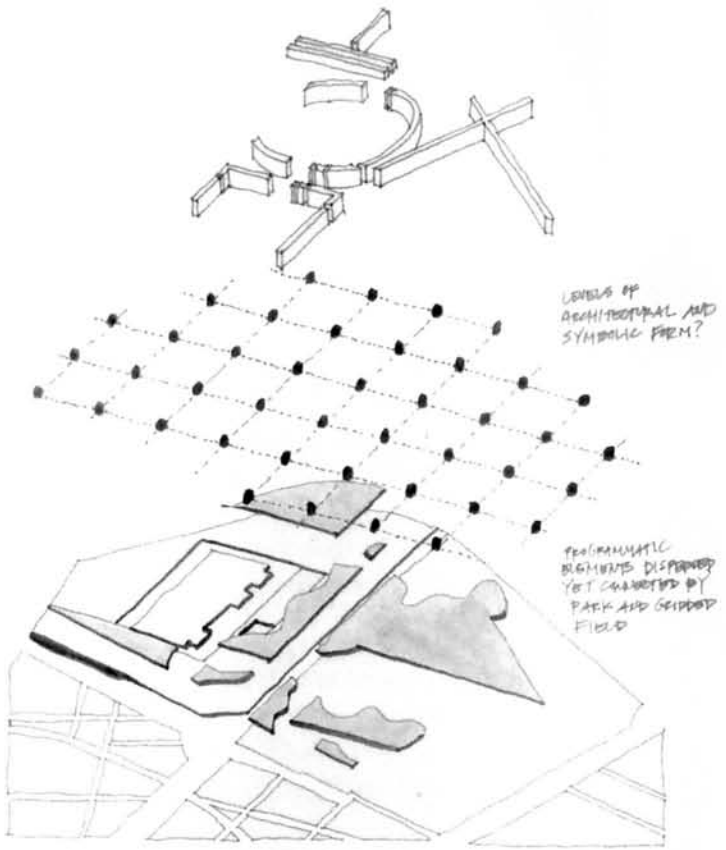
Parc de la Villette



Parc de La Villette consists of 35 "folie" or programmatic pieces. These pieces are dispersed across a large expanse of park. The pieces are connected through landscape and site manipulation. Some of the program consists of a large Museum of Science and Industry, a City of Music, a Grande Hall for exhibitions and a concert hall. Tschumi various levels of form (surface, point, and line) as the ordering system for the project.

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All Images by the author with the exception of:

1,12-14
Landmarks Commission Report

2,9-11
The Seaport Public Realm Plan

3
Wexner Center for the Visual Arts

8
Boston Redevelopment Authority

4-7
Carlo Scarpa Architect: Intervening with History

15,16
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